embryological method, and conclusions which are not supported by both methods conjointly must be looked upon with distrust.

The Connections of the Inferior Peduncle of the Cerebellum with the Posterior Columns of the Cord. L. DARKSCHEWITSCH and S. FREUD, *Neurol. Centralbl.*, No. 6, 1886.

It is well known that the inferior peduncle of the cerebellum is made up of numerous bundles of fibres collected from different parts of the cord and medulla. The authors of this article describe a cross section of the peduncle as an elliptical figure somewhat bent inward at its extremities and consisting of three parts. There is a central portion divided into a ventral and a dorsal half and a peripheral portion surrounding the two inner halves. The ventral half of the central portion is continuous with the direct cerebellar column of the spinal cord. The dorsal half of the central portion is connected with the nuclei of the posterior column of the cord. The peripheral portion is connected with the opposite olivary body. There is no difference of opinion regarding the first and third of these constituents of the inferior peduncle. Views have been held regarding the connection of the nuclei of the posterior columns of the cord with the cerebellum which are incompatible (See JOUR. NERV. AND MENT. DIS., July, 1884, p. 348, and Jan., 1885, p. 107). The authors have, therefore, reviewed the various opinions and have examined a series of sections through fœtal medullæ with the result of establishing the following facts :

The nucleus cuneatus extends cephalad for a much greater distance than the nucleus gracilis, and in its upper part lies in the dorsal half of the inner portion of the inferior peduncle, forming the "nucleus of the restiform body" of Wernicke. From it fibres enter the inferior peduncle, thus connecting it with the cerebellum. Fibres also issue from it and pass ventrad as fibræ arcuatæ. These cross the middle line in the so-called sensory decussation, but instead of turning cephalad in the interolivary tract they continue ventrad and pass between the lateral border of the pyramid and the olivary body to the surface of the medulla, where they become arciform fibres and, curving around the lateral surface of the medulla dorsad, they enter the inferior peduncle of the cerebellum. The same course is traced for a few fibres from the nucleus gracilis. Thus each nucleus cuneatus and gracilis sends fibres to both inferior peduncles of the cerebellum. This course had been previously described by Edinger, so that these researches are merely confirmatory of his position. The authors also confirm his statements regarding the entrance into the inferior peduncle of short arcuate fibres from the nuclei gracilis and cuneatus. (See JOUR. NERV. AND MENT. DIS., Jan., 1885, p. 108).

On the Effect of Hardening Methods upon the Microscopic Appearances in the Spinal Cord. After a review in *Neurol. Centralbl.*, No. 1, 1886.

Danilo and Popow having recently described certain changes in the appearance of the motor cells of the spinal cord in rabbits and dogs after poisoning with arsenic and phosphorus, F. Kreyssig has repeated the experiments under F. Schultze's direction, and observed the results (*Virchow's Archiv*, Bd. 102). In preparation for the investigation the normal appearances in the cords of these animals were examined, and certain important facts were elicited, which may have a wider application than the author suspects. He found that after hardening in Müller's fluid or any chromic-acid solution the cells of the normal cords presented great varieties of appearance, and of power of absorbing coloring matter. Some cells were colored dark and surrounded by a pericellular space; others were pale and were not so surrounded. Vacuoles were found in the cells, large cells without processes, whose body was apparently deficient in protoplasm were observed, especially in young animals. All these changes which were ascribed by the earlier investigators to effects of the poisons were therefore present in normal cords. It was found, however, that these appearances were more evident in cords which had been transferred from Müller's fluid to 96 % alcohol than those which had been placed in 10 % alcohol and then in solutions of alcohol of increasing strength till the strong solution was reached. The appearances were consequently ascribed to the effects of the strong alcohol upon the cords hardened in the chromate salts. When the proper precautions were taken with the cords of animals poisoned with arsenic and phosphorus no such appearances were found as had been described by Danilo, capillary hemorrhages being the only lesion produced by the poison.

It is not at all impossible that the same precautions would be advisable in hardening human cords, since the appearances found resemble those often observed in human cords hardened in the usual manner. M. A. STARR.

PHYSIOLOGY (INCLUDING EXPERIMENTAL PHYSIOLOGY) OF THE NERVOUS SYSTEM.

The Relation Between the Temperature Changes in the External Auditory Canal and the Circulation of the Brain. *Pflüger's Archiv*, Bd. 38, Heft 3 and 4.

Dr. Istamanoff has made a series of experiments upon the subject. The observations of Dr. Mendel have demonstrated that the temperature in the external auditory canal is about 2° lower than that of the axilla. If now we compare this statement with the results of Dr. Wassiljeff, that the temperature of the external auditory canal gives the temperature of the brain, then it may be assumed that the temperature of the brain is lower or similar to the temperature in the axilla, which is opposed to facts stated by Drs. Heidenheim and Körner, that the brain is the warmest organ in the organism. He went over Dr. Wassiljeff's experiments and found that under the influence of hot applications to the hand of